



***Martin<sup>®</sup> QC1+<sup>™</sup>  
Cleaner PV  
with One-Piece Mainframe***



***Operator's Manual  
M4131***

# Important

MARTIN ENGINEERING HEREBY DISCLAIMS ANY LIABILITY FOR: DAMAGE DUE TO CONTAMINATION OF THE MATERIAL; USER'S FAILURE TO INSPECT, MAINTAIN AND TAKE REASONABLE CARE OF THE EQUIPMENT; INJURIES OR DAMAGE RESULTING FROM USE OR APPLICATION OF THIS PRODUCT CONTRARY TO INSTRUCTIONS AND SPECIFICATIONS CONTAINED HEREIN. MARTIN ENGINEERING'S LIABILITY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF EQUIPMENT SHOWN TO BE DEFECTIVE.

Observe all safety rules given herein along with owner and Government standards and regulations. Know and understand lockout/tagout procedures as defined by American National Standards Institute (ANSI) z244.1-1982, *American National Standard for Personnel Protection - Lockout/Tagout of Energy Sources - Minimum Safety Requirements* and Occupational Safety and Health Administration (OSHA) Federal Register, Part IV, 29 CFR Part 1910, *Control of Hazardous Energy Source (Lockout/Tagout); Final Rule*.

The following symbols may be used in this manual:



**Danger:** Immediate hazards that will result in severe personal injury or death.



**Warning:** Hazards or unsafe practices that could result in personal injury.



**Caution:** Hazards or unsafe practices that could result in product or property damages.



**Important:** Instructions that must be followed to ensure proper installation/operation of equipment.



**Note:** General statements to assist the reader.

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## **General**

The Martin® QC1+™ Cleaner PV combines effective removal of carryback with “quick-change” replacement of a long-lasting, one-piece blade. To introduce product back into the product flow, the Martin® QC1+™ Cleaner PV is installed on the face of the head pulley. On a dual-cleaner system, a Secondary Cleaner is installed immediately following the Pre-Cleaner to remove stubborn material left on the conveyor belt. If a Pre-Cleaner cannot be used because of space limitations, Secondary Cleaners can be installed alone. Multiple Pre-Cleaners and/or Secondary Cleaners may be required to clean the belt. If the material-handling process or product could be affected by contamination from the use of these belt cleaners, the user is responsible for taking the necessary steps to prevent contamination. Consult Martin Engineering or a representative for alternate belt cleaners or belt cleaner locations to use where contamination may be an issue.

## **Installations without chutework**

These procedures were written for equipment that is being installed on enclosed pulley chutework. If the pulley is not enclosed, the equipment should be installed using the best available field resources and methods to ensure that the critical dimensions are followed for proper installation.

## **Belt cleaner inspection access**

If the belt cleaner is installed on enclosed pulley chutework, at least one Martin® Inspection Door should be installed. Martin® Inspection Doors are available from Martin Engineering or a representative.

## **Belt cleaner blades**

Martin® QC1+™ Cleaner PV Blades are available in five different materials (see Table I for specifications). Only standard (orange) Martin® QC1+™ Cleaner PV Blades are made of materials that meet Mine Safety and Health Administration (MSHA) requirements under “Interim Fire and Toxicity Criteria for Products Taken Into Underground Mines,” March 22, 1977 (MSHA acceptance number MSHA-IC-95/1, MSHA-IC-95/7).

## **References**

The following documents are referenced in this manual:

- American National Standards Institute (ANSI) z244.1-1982, *American National Standard for Personnel Protection - Lockout/Tagout of Energy Sources - Minimum Safety Requirements*, American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.
- Federal Register, Volume 54, Number 169, Part IV, 29 CFR Part 1910, *Control of Hazardous Energy Source (Lockout/Tagout); Final Rule*, Department of Labor, Occupational Safety and Health Administration (OSHA), 32nd Floor, Room 3244, 230 South Dearborn Street, Chicago, IL 60604.
- *Martin® Inspection Door Operator’s Manual*, P/N M3891
- *Martin® Twist Tensioner Operator Manual*, P/N M3837
- *Martin® Spring Cable Tensioner Operator Manual*, P/N M3734
- *Martin® Spring and Air Tensioners Operator Manual*, P/N M3263

## **Materials required**

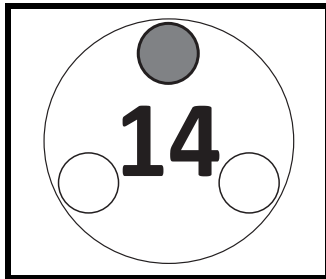
Installation of this equipment requires the use of standard hand tools, grinder, welder, and cutting torch.

Table I. Martin® QC1+™ Cleaner PV Blade Colors, Materials and Specifications

URETHANE SELECTION	APPLICATION DESCRIPTION	TYPICAL MATERIALS	CONTINUOUS TEMPERATURE
Orange	<b>Standard Martin® Urethane</b> Suitable for 80% or more of all belt cleaner applications, including abrasive conditions.	Bauxite, Coke, Coal, Overburden Refuse	-20° to 160°F (-29° to 71°C)
Brown (BR)	<b>Chemical-Resistant Urethane</b> Improves resistance to chemicals; reduced absorption of water in high-moisture environments.	Limestone	-40° to 160°F (-40° to 71°C)
Green (GR)	<b>High-Temperature Urethane</b> For exposure to intermittent temperatures up to 350°F (177°C).	Clinker	-40° to 300°F (-40° to 149°C)
Clear (CL)	<b>Low-Rigidity Urethane</b> For dry products such as sand and gravel.	Gravel, Dry Sand	-20° to 160°F (-29° to 71°C)
Navy Blue (NB)	<b>Low-Adhesion Urethane</b> For sticky or tacky materials.	Cement, Glass, Wood Chips	-20° to 160°F (-29° to 71°C)

**IMPORTANT***Urethane shelf life*

Urethane put in service after exceeding its shelf life may wear differently and deteriorate quicker than normal urethane.

**NOTE**

Code Date is written near bottom of blade as mm/dd/yy-x. In addition to or in place of this date, you may see an imprinted date medallion similar to the example shown. In this example, “14” stands for the year 2014. The small circles represent the quarter of the year. If three circles are “punched” the blade was produced in the first quarter. If none of the circles are “punched” the blade was produced in the fourth quarter. If code date on your blade(s) is not legible or is missing, contact Martin Engineering or a representative.

Table II. Urethane Shelf Life

Blade Color	Shelf Life
Blue	1 Year from Code Date
Brown	2 Years from Code Date
Clear	1 Year from Code Date
Green	2 Years from Code Date
Orange	1 Year from Code Date

## Safety

All safety rules defined in the above documents and all owner/employer safety rules must be strictly followed when working on the belt cleaner.



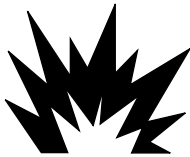
### **⚠ DANGER**

Do not touch or go near the conveyor belt or conveyor accessories when the belt is running. Your body or clothing can get caught and you can be pulled into the conveyor, resulting in severe injury or death.



### **⚠ DANGER**

Before installing, servicing, or adjusting the belt cleaner, turn off and lockout / tagout / blockout / testout all energy sources to the conveyor and conveyor accessories according to ANSI standards. Failure to do so could result in serious injury or death.



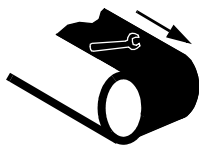
### **⚠ DANGER**

If this equipment will be installed in an enclosed area, test the gas level or dust content before using a cutting torch or welding. Using a torch or welding in an area with gas or dust may cause an explosion resulting in serious injury or death. Follow local confined space procedures.



### **⚠ WARNING**

Before using a cutting torch or welding the chute wall, cover the conveyor belt with a fire retardant cover. Failure to do so can allow the belt to catch fire. Follow local fire watch procedures.



### **⚠ WARNING**

Remove all tools from the installation area and conveyor belt before turning on the conveyor. Failure to do so can cause serious injury to personnel or damage to the belt and conveyor.



### **⚠ WARNING**

Mainframe with blade can be heavy and may require two people to lift. Attempting to lift the belt cleaner without assistance could result in injury.

## Before Installing Belt Cleaner

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### IMPORTANT

The delivery service is responsible for damage occurring in transit. Martin Engineering CANNOT enter claims for damages. Contact your transportation agent for more information.

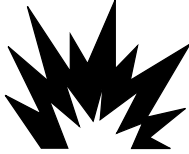
1. Inspect shipping container for damage. Report damage to delivery service immediately and fill out delivery service's claim form. Keep any damaged goods subject to examination.
2. Remove belt cleaner assembly from shipping container.
3. If anything is missing contact Martin Engineering or a representative.



### ⚠ DANGER

Before installing, servicing, or adjusting the belt cleaner, turn off and lockout / tagout / blockout / testout all energy sources to the conveyor and conveyor accessories according to ANSI standards. Failure to do so could result in serious injury or death.

4. Turn off and lockout / tagout / blockout / testout energy source according to ANSI standards (see "References").



### ⚠ DANGER

If this equipment will be installed in an enclosed area, test the gas level or dust content before using a cutting torch or welding. Using a torch or welding in an area with gas or dust may cause an explosion resulting in serious injury or death. Follow local confined space procedures.

5. If using a cutting torch or welding, test atmosphere for gas level or dust content. Cover conveyor belt with fire retardant cover.

### IMPORTANT

Center the belt cleaner blades to clean an area narrower than the conveyor belt width. This allows for side-to-side movement of the belt and prevents damage to the belt edge.

### NOTE

The chute wall that the tensioner will be located on is referred to as the "operator side." The other side of the chute is referred to as the "far side." (If installing dual tensioners, side that is most accessible is "operator side.")



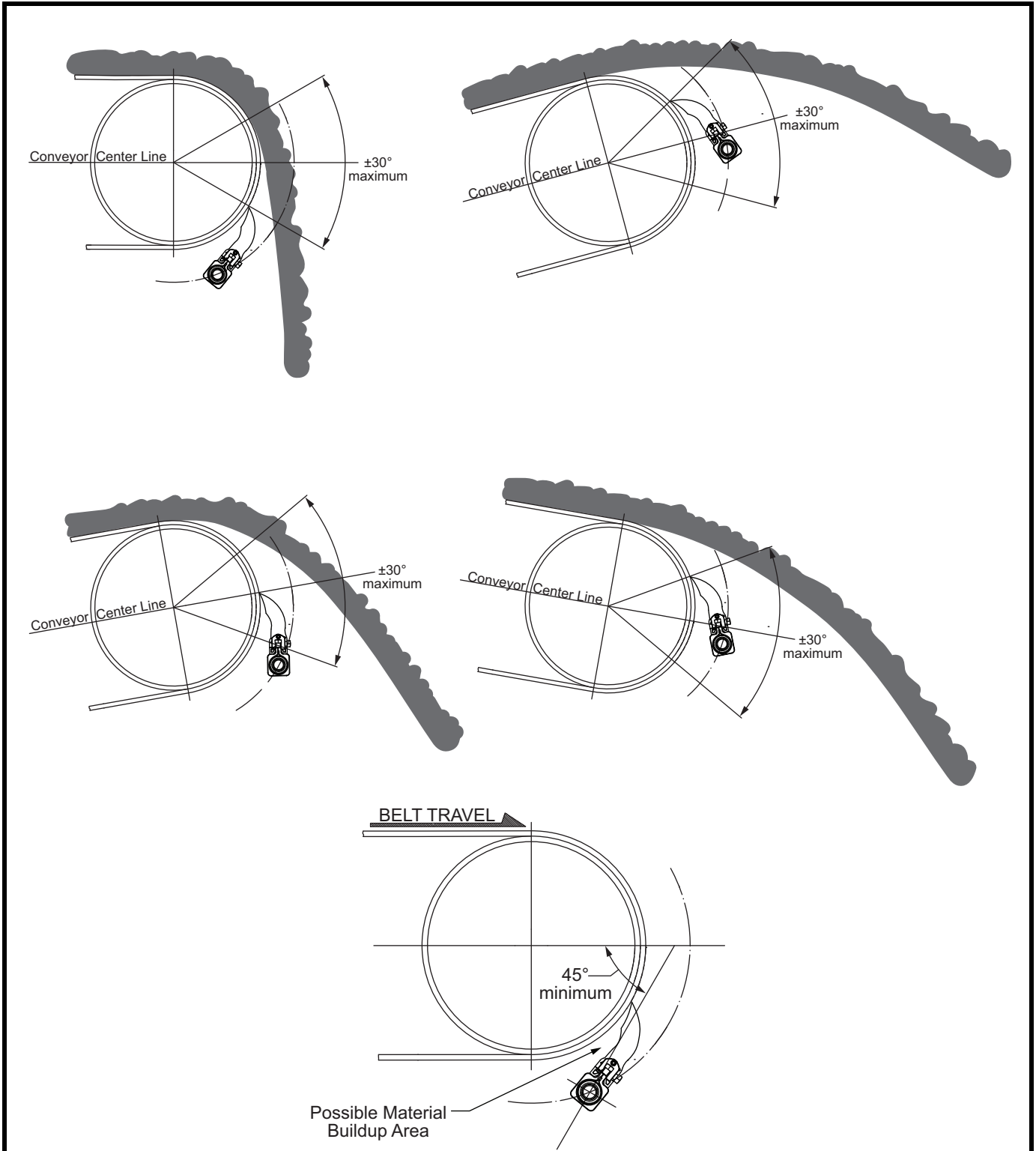
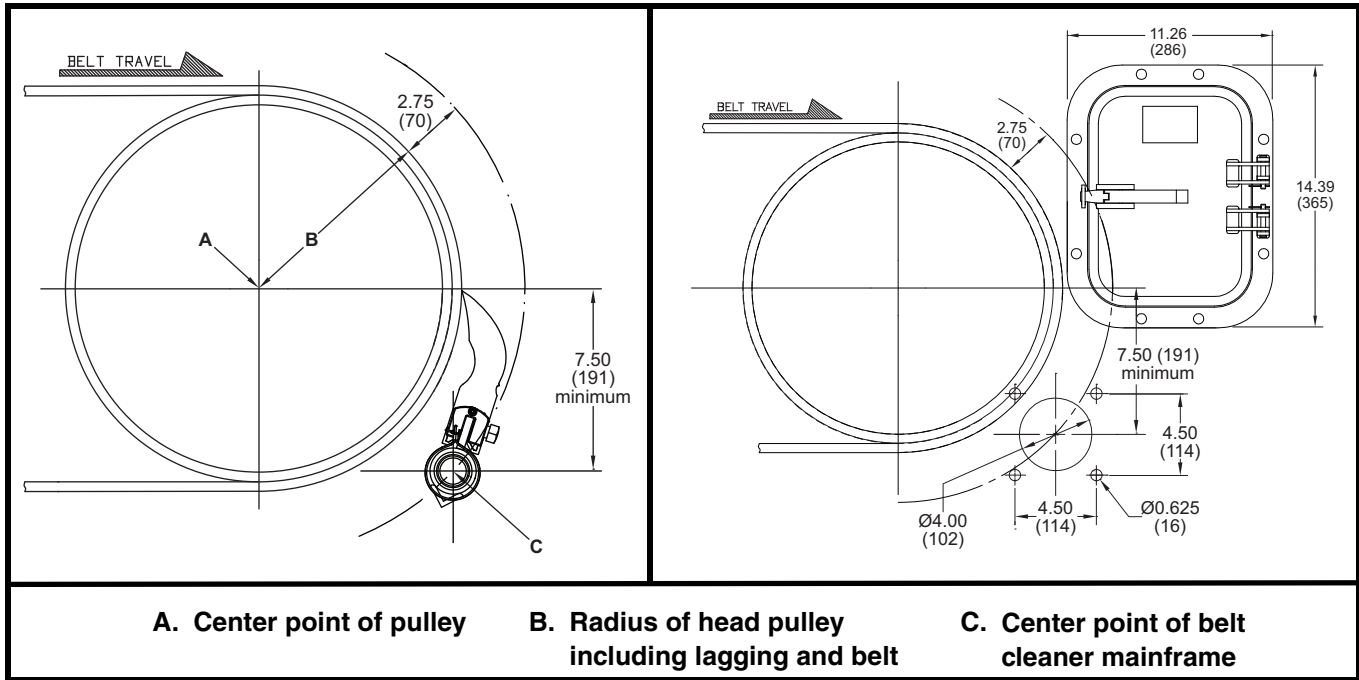


Figure 1. Belt Cleaner Mounting Locations

6. Inspect belt cleaner mounting area for possible obstructions that could interfere with proper mounting. Refer to following guidelines:
  - a. The cleaner can be mounted anywhere on the arc from +30 degrees to -30 degrees from a center line parallel to the belt line as long as:
    - (1) The blade is not in the direct flow of discharging material causing premature blade wear.
    - (2) The diameter of the pulley is big enough that the blade does not trap or hold material between the inside of the blade and the belt.
    - (3) There is at least the equivalent of a 45 degree angle between the blade and belt to prevent material buildup in this space.
  - b. Lack of service is the main cause of poor belt cleaning performance. Follow CEMA guidelines for access:
    - (1) Clearance for service outside the chute must be at least equal to the belt width.
    - (2) Cleaners must have service platforms. CEMA recommends cleaners be mounted at least 24 in. (600 mm) above the work platform.
    - (3) If the belt width is 54 in. (1400 mm) or larger consider access doors on both sides of the chute.
  - c. Refer to “Installing Belt Cleaner and Tensioner” and “Part Numbers” sections of this manual for specific mounting and cleaner dimensions.

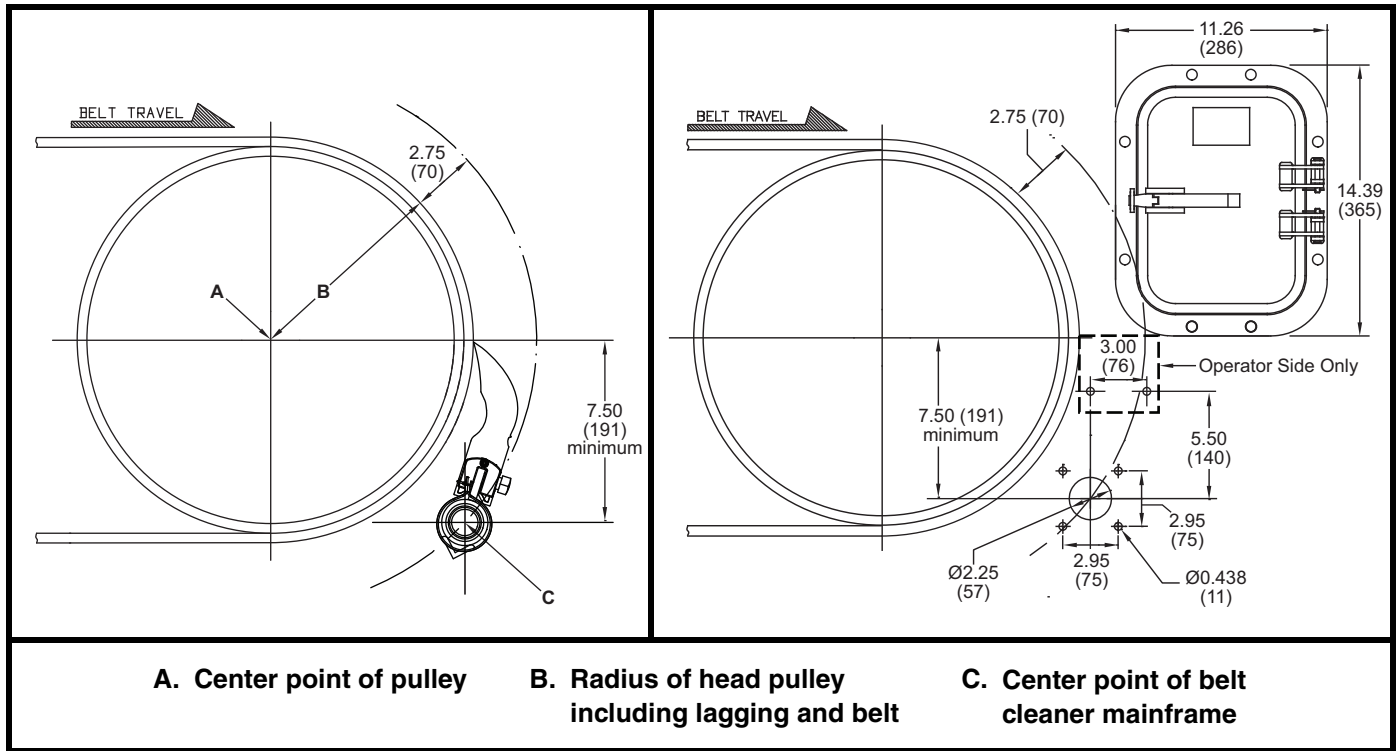
# Installing Belt Cleaner and Tensioner



**Figure 2. Belt Cleaner Mainframe Location & Chute Wall Cutouts**  
**Martin® QC1+ Cleaner PV with Martin® Twist Tensioner or Martin® Spring Tensioner**

***Locating belt cleaner mainframe—  
 Twist Tensioner/  
 Spring Tensioner***

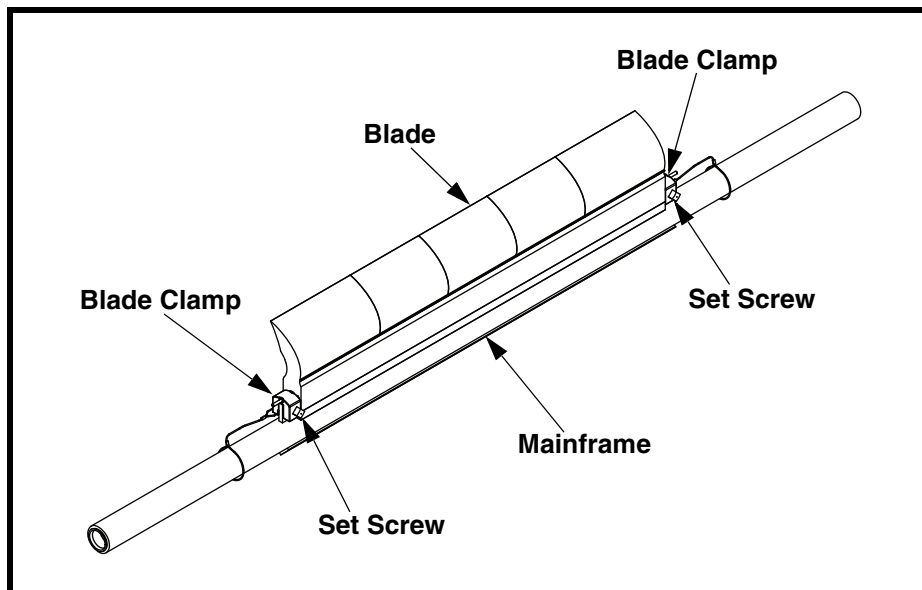
1. On operator side of chute, find pulley center point (A).
2. Measure radius of head pulley including lagging and belt thickness (B). To this dimension, add 2.75 in. (70 mm).
3. Starting from center point (A), measure the total distance calculated in step 2 (B + 2.75) and draw an arc on chute wall.
4. Measure down from pulley's horizontal centerline the distance shown in Figure 2 and draw a horizontal line parallel to it. Locate center point of belt cleaner mainframe (C) where this line intersects the arc on the chute wall.
5. Make sure mainframe and blade do not lie in path of material unloading from conveyor belt.
6. Repeat steps 1 through 5 for far side chute wall.
7. Drill or cut holes for tensioner mounting plates on chute walls as follows:
  - a. If bolting tensioner mounting plates to chute walls, do the following:
    - (1) Drill or cut one 4-in. hole for mainframe and four 5/8-in. holes for screws in both operator side and far side chute walls. Remove burrs and sharp edges.
  - b. If welding tensioner mounting plates to chute walls, do the following:
    - (1) Drill or cut one 4-in. hole for mainframe in both operator side and far side chute walls. Remove burrs and sharp edges.
8. If using Martin® Inspection Door, cut access door opening and mounting holes according to *Martin® Inspection Door Operator's Manual*, P/N M3891.



**Figure 3. Belt Cleaner Mainframe Location & Chute Wall Cutouts for Martin<sup>®</sup> QC1+ Cleaner PV with Martin<sup>®</sup> Spring Cable Tensioner**

***Locating belt cleaner mainframe—Spring Cable Tensioner***

1. On operator side of chute, find pulley center point (A).
2. Measure radius of head pulley including lagging and belt thickness (B). To this dimension, add 2.75 in. (70 mm).
3. Starting from center point (A), measure the total distance calculated in step 2 (B + 2.75) and draw an arc on chute wall.
4. Measure down from pulley's horizontal centerline the distance shown in Figure 2 and draw a horizontal line parallel to it. Locate center point of belt cleaner mainframe (C) where this line intersects the arc on the chute wall.
5. Make sure mainframe and blade do not lie in path of material unloading from conveyor belt.
6. Repeat steps 1 through 5 for far side chute wall.
7. Drill or cut holes for tensioner mounting plates on chute walls as follows:
  - a. If bolting tensioner mounting plates to chute walls, do the following:
    - (1) Drill or cut one 2.25-in. hole for mainframe and four 1/2-in. holes for screws in both operator side and far side chute walls. Remove burrs and sharp edges.
  - b. If welding tensioner mounting plates to chute walls, do the following:
    - (1) Drill or cut one 2.25-in. hole for mainframe in both operator side and far side chute walls. Remove burrs and sharp edges.
8. If using Martin<sup>®</sup> Inspection Door, cut access door opening and mounting holes according to *Martin<sup>®</sup> Inspection Door Operator's Manual*, P/N M3891.



**Figure 4. Removing and Installing Blade**

***Removing blade***

1. Loosen set screw on each blade clamp. Remove blade clamp from blade and mainframe. Make sure blade clamp lanyards remain attached to mainframe.
2. Remove blade from mainframe.

***Installing tensioner***

1. Install tensioner according to applicable tensioner's manual.
2. If using Martin® Inspection Door, install according to *Martin® Inspection Door Operator's Manual*, P/N M3891.

***Installing blade***

1. Position blade on mainframe with blade curve facing conveyor belt.
2. Install blade clamps onto mainframe and insert into blade.
3. Center blade on mainframe and tighten blade clamp set screws.
4. Make sure blades are centered on belt and mainframe is parallel to belt.
5. Tension belt cleaner according to applicable tensioner's manual.

# After Installing Belt Cleaner



1. Thoroughly wipe chute wall clean above tensioner.
2. Place Conveyor Products Warning Label (P/N 23395) on outside chute wall visible to belt cleaner operator.
3. Additional safety labels are available from CEMA. For more information regarding CEMA safety labels visit [www.cemanet.org](http://www.cemanet.org).



**Failure to remove tools from installation area and conveyor belt before turning on energy source can cause serious injury to personnel and damage to belt.**



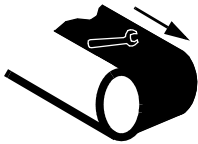
**Do not touch or go near conveyor belt or conveyor accessories when conveyor belt is running. Body or clothing can get caught and pull body into conveyor belt, causing severe injury or death.**

4. Turn on conveyor belt for 1 hour, then turn off.



**Before installing, servicing, or adjusting the belt cleaner, turn off and lockout / tagout / blockout / testout all energy sources to the conveyor and conveyor accessories according to ANSI standards. Failure to do so could result in serious injury or death.**

- a. Make sure all fasteners are tight. Tighten if necessary.
- b. Inspect belt cleaner for the following:
  - (1) Wear. (A small amount of “break-in” wear may be found. This will stop once blades wear to conveyor belt contour.)
  - (2) Material buildup. (No material between blades and return side of conveyor belt should be found.)
- c. If wear, material buildup, or some other problem exists, see “Troubleshooting.”



## IMPORTANT

Read entire section before beginning work.

## NOTE

Maintenance inspection should be performed no less than weekly. Some applications may require more frequent maintenance inspections.



## ⚠ DANGER

Before installing, servicing, or adjusting the belt cleaner, turn off and lockout / tagout / blockout / testout all energy sources to the conveyor and conveyor accessories according to ANSI standards. Failure to do so could result in serious injury or death.

1. Remove any material from belt cleaner.
2. Make sure all fasteners are tight. Tighten if necessary.
3. Check tension on cleaner. Re-tension if necessary.
4. Wipe all labels clean. If labels are not readable, contact Martin Engineering or a representative for replacements.
5. Check blades for excessive wear. Replace if necessary.
6. Remove equipment from service if there is any indication it is not functioning properly. Call Martin Engineering or a representative for assistance. Do NOT return equipment to operation until the cause of the problem has been identified and corrected.

## ⚠ WARNING

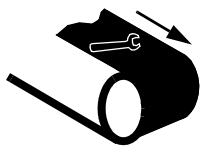
Failure to remove tools from maintenance area and conveyor belt before turning on energy source can cause serious injury to personnel and damage to belt.

7. Remove all tools from maintenance area.

## ⚠ DANGER

Do not touch or go near conveyor belt or conveyor accessories when conveyor belt is running. Body or clothing can get caught and pull body into conveyor belt, causing severe injury or death.

8. Start conveyor belt. Observe belt cleaner operation for several revolutions of the belt. Service or adjust belt cleaner as necessary to ensure proper belt cleaner operation.



# Troubleshooting

Symptom	Corrective Action
Insufficient cleaning and carryback.	<ul style="list-style-type: none"> <li>• Tension of cleaner on belt is set too low or too high. Increase or decrease tensioner setting.</li> <li>• Blades are worn. Check blades and replace if necessary.</li> </ul>
Blade wears only in the center.	<ul style="list-style-type: none"> <li>• Use a segmented style blade for crown pulleys.</li> <li>• Consider narrowing the blade width to clean the middle of the belt.</li> </ul>
Noise or vibration.	Tension is not sufficient or is set too high. Correct tension as necessary. If this does not correct problem, blade urethane may not match application. Contact Martin Engineering or representative.
High blade wear rate.	Tension of cleaner on belt is set too high. Reduce tensioner setting.
Unusual wear or damage to blades.	Check belt splice(s) and repair as necessary.
Bent or broken mainframe or support frame due to blade slipping through.	If blades are worn to or past the wear line, replace blades. If blades are not worn, check mainframe location.
Corrosion or chemical degradation.	Blade urethane may not match application. Contact Martin Engineering or a representative.

## NOTE

**Conveyor equipment such as conveyor belt cleaners are subject to a wide variety of bulk materials characteristics and often have to perform under extreme operating or environmental conditions. It is not possible to predict all circumstances that may require troubleshooting. Contact Martin Engineering or a representative if you are experiencing problems other than those listed in the “Troubleshooting” chart above. Do not return the equipment to operation until the problem has been identified and corrected.**

### ***Installation checklist***

If after taking the corrective actions suggested under “Troubleshooting” you are still experiencing problems, check for the following:

Installation Checklist
✓ Pre-Cleaner mainframe is proper distance from belt surface on both ends of mainframe and parallel to the pulley shaft.
✓ Pre-Cleaner blade tip does not lie in path of material flow.
✓ Blades are centered on belt.

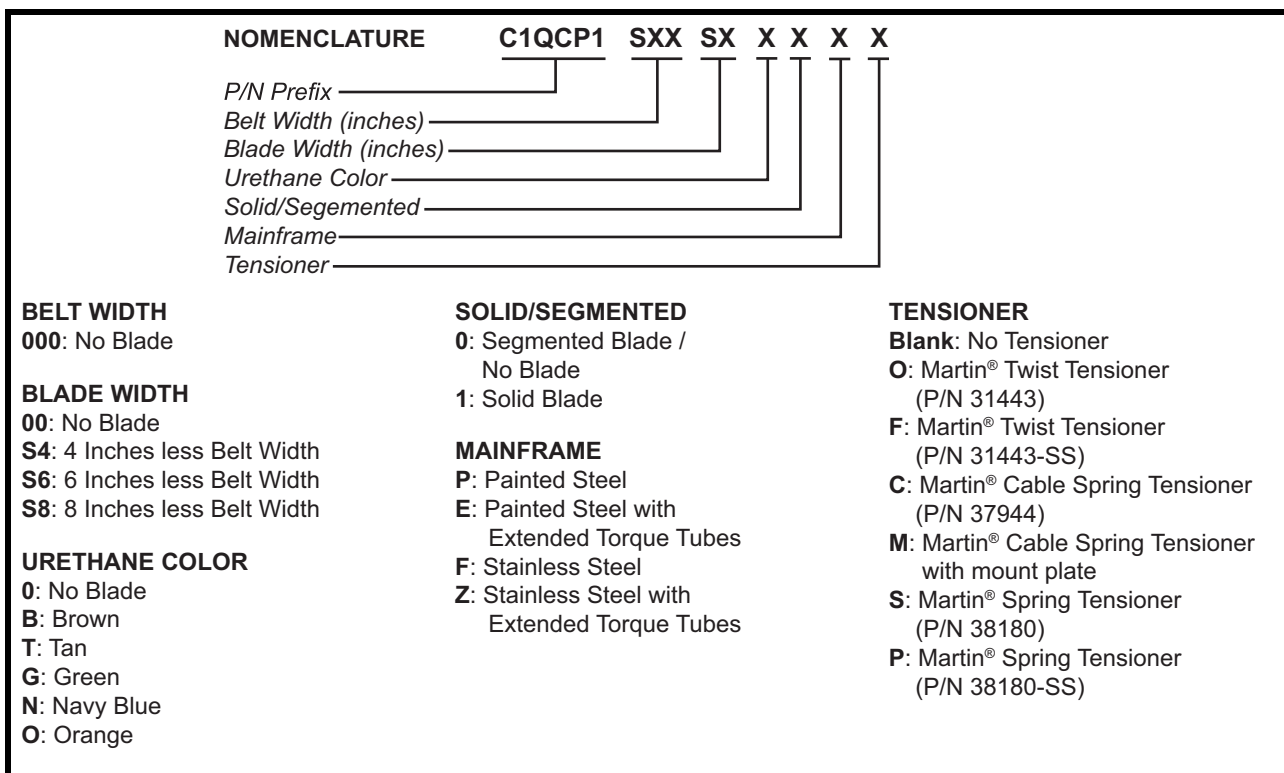


# Part Numbers

This section provides product names and corresponding part numbers for Martin® QC1+™ Cleaner PV and related equipment. Please reference part numbers when ordering parts:

**Martin® QC1+™ Cleaner PV**

**Martin® QC1+™ Cleaner PV Assembly:**  
P/N C1QCP1SXXSXXPX. See Figure 5.



**Recommended Tensioners**

- Martin® Twist Tensioner - Square: P/N 31443 or 31443-2R.
- Martin® Spring Tensioner: P/N 38180 or 38180-2
- Martin® Cable Spring Tensioner: P/N 37944 or 37944-2.

**Operator's manuals**

- Martin® Spring and Air Tensioners Operator's Manual: P/N M3263.
- Martin® Spring Cable Tensioners Operator's Manual: P/N M3734.
- Martin® Twist Tensioner Operator's Manual: P/N M3837.
- Martin® Inspection Door Operator's Manual: P/N M3891.

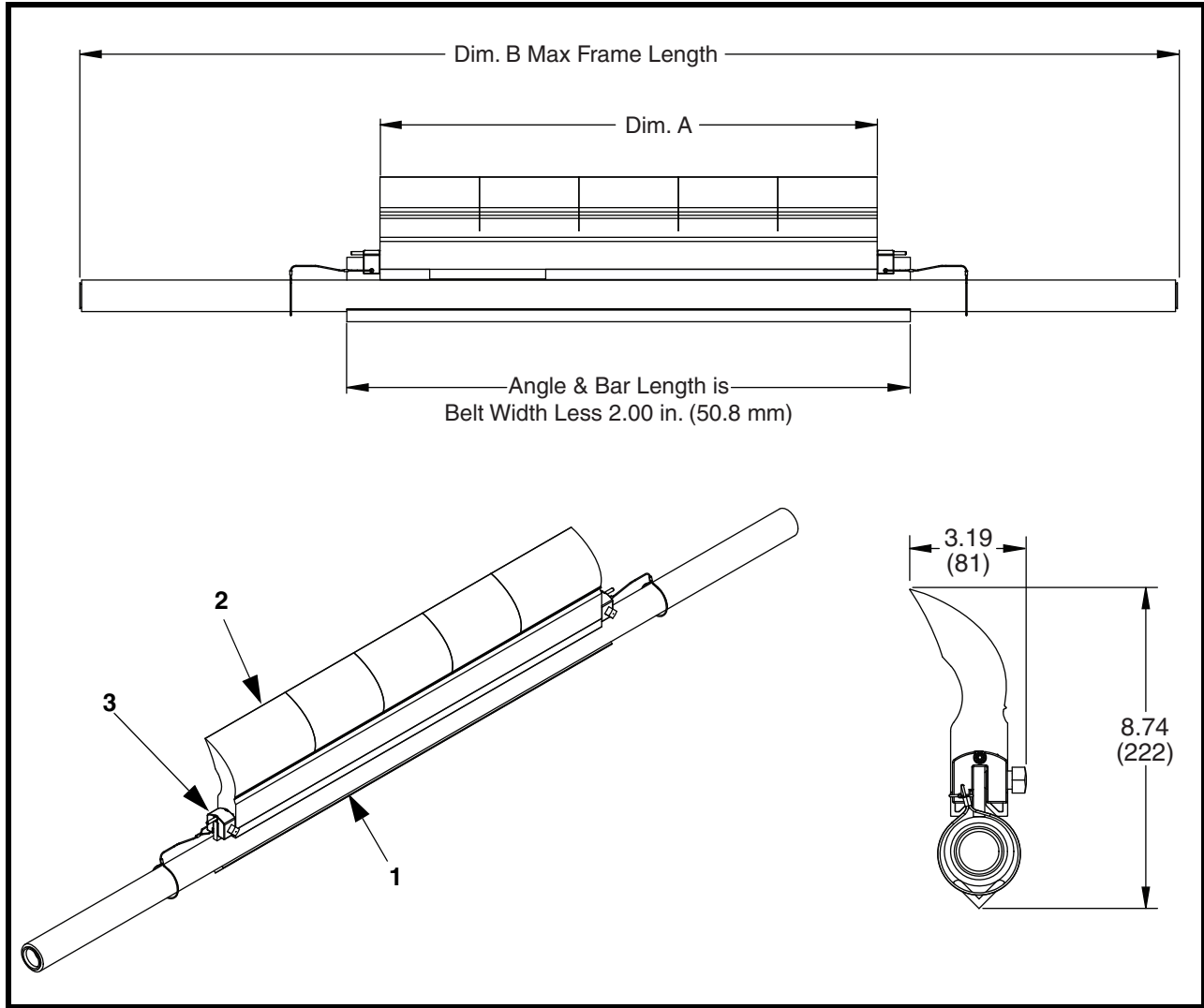


Figure 5. Martin® QC1+™ Cleaner PV Assembly, P/N C1QCP1SXXXSXXXPX

Item	Description	Part No.	Qty.
1	Mainframe Weldment	Table III	1
2	Blade	Table III	1
3	Blade Clamp	C1QCA1003ST	2
4 (NS)	Label Martin® Products	38048	2
5 (NS)	Label Conveyor Products Warning	23395	2
6 (NS)	Manual Operator's	M4131	1
7 (NS)	Martin® Twist Tensioner Assembly	Table IV	1

NS = Not Shown

**Table III. Part Numbers and Dimensions for Martin® QC1+™ Cleaner PV Assembly**

Assembly Part No.	Dim. A in. (mm)	Dim. B in. (mm)	Item No. 1	Item No. 2	Weight (lbs.) w/o Tensioner
C1QCP1S18S4XXPX	14 (356)	48 (1219)	C1QCP1MS16P	C1QCPBS14XX	24.7
C1QCP1S18S6XXPX	12 (305)			C1QCPBS12XX	24.0
C1QCP1S18S8XXPX	10 (254)			C1QCPBS10XX	23.1
C1QCP1S24S4XXPX	20 (508)	54 (1372)	C1QCP1MS22P	C1QCPBS20XX	30.2
C1QCP1S24S6XXPX	18 (457)			C1QCPBS18XX	29.5
C1QCP1S24S8XXPX	16 (406)			C1QCPBS16XX	28.7
C1QCP1S30S4XXPX	26 (660)	60 (1524)	C1QCP1MS28P	C1QCPBS26XX	35.7
C1QCP1S30S6XXPX	24 (610)			C1QCPBS24XX	35.1
C1QCP1S30S8XXPX	22 (559)			C1QCPBS22XX	34.2
C1QCP1S36S4XXPX	32 (813)	66 (1676)	C1QCP1MS34P	C1QCPBS32XX	41.2
C1QCP1S36S6XXPX	30 (762)			C1QCPBS30XX	40.3
C1QCP1S36S8XXPX	28 (711)			C1QCPBS28XX	39.7
C1QCP1S42S4XXPX	38 (965)	72 (1829)	C1QCP1MS40P	C1QCPBS38XX	46.7
C1QCP1S42S6XXPX	36 (914)			C1QCPBS36XX	45.9
C1QCP1S42S8XXPX	34 (864)			C1QCPBS34XX	45.2
C1QCP1S48S4XXPX	44 (1118)	78 (1981)	C1QCP1MS46P	C1QCPBS44XX	52.2
C1QCP1S48S6XXPX	42 (1067)			C1QCPBS42XX	51.4
C1QCP1S48S8XXPX	40 (1016)			C1QCPBS40XX	50.7
C1QCP1S54S4XXPX	50 (1270)	84 (2134)	C1QCP1MS52P	C1QCPBS50XX	57.8
C1QCP1S54S6XXPX	48 (1219)			C1QCPBS48XX	56.9
C1QCP1S54S8XXPX	46 (1168)			C1QCPBS46XX	56.0
C1QCP1S60S4XXPX	56 (1422)	90 (2286)	C1QCP1MS58P	C1QCPBS56XX	63.1
C1QCP1S60S6XXPX	54 (1372)			C1QCPBS54XX	62.4
C1QCP1S60S8XXPX	52 (1321)			C1QCPBS52XX	61.5
C1QCP1S66S4XXPX	62 (1575)	96 (2438)	C1QCP1MS64P	C1QCPBS62XX	68.6
C1QCP1S66S6XXPX	60 (1524)			C1QCPBS60XX	67.9
C1QCP1S66S8XXPX	58 (1473)			C1QCPBS58XX	67.0
C1QCP1S72S4XXPX	68 (1727)	102 (2591)	C1QCP1MS70P	C1QCPBS68XX	74.1
C1QCP1S72S6XXPX	66 (1676)			C1QCPBS66XX	73.4
C1QCP1S72S8XXPX	64 (1626)			C1QCPBS64XX	72.5

Part Numbers

**Table IV. Tensioner Part Numbers**

Belt Width	Martin® Twist Tensioner		Martin® Spring Tensioner		Martin® Cable Spring Tensioner	Martin® Cable Spring Tensioner Mount
	Square	Square Stainless Steel	Painted	Stainless Steel		
18 thru 48	31443	31443-SS	38180	38180-SS	37944	38100
54 and Above	31443-2R	31443-DSS	38180-2	38180-2SS		
60 and Above					37944-2	—

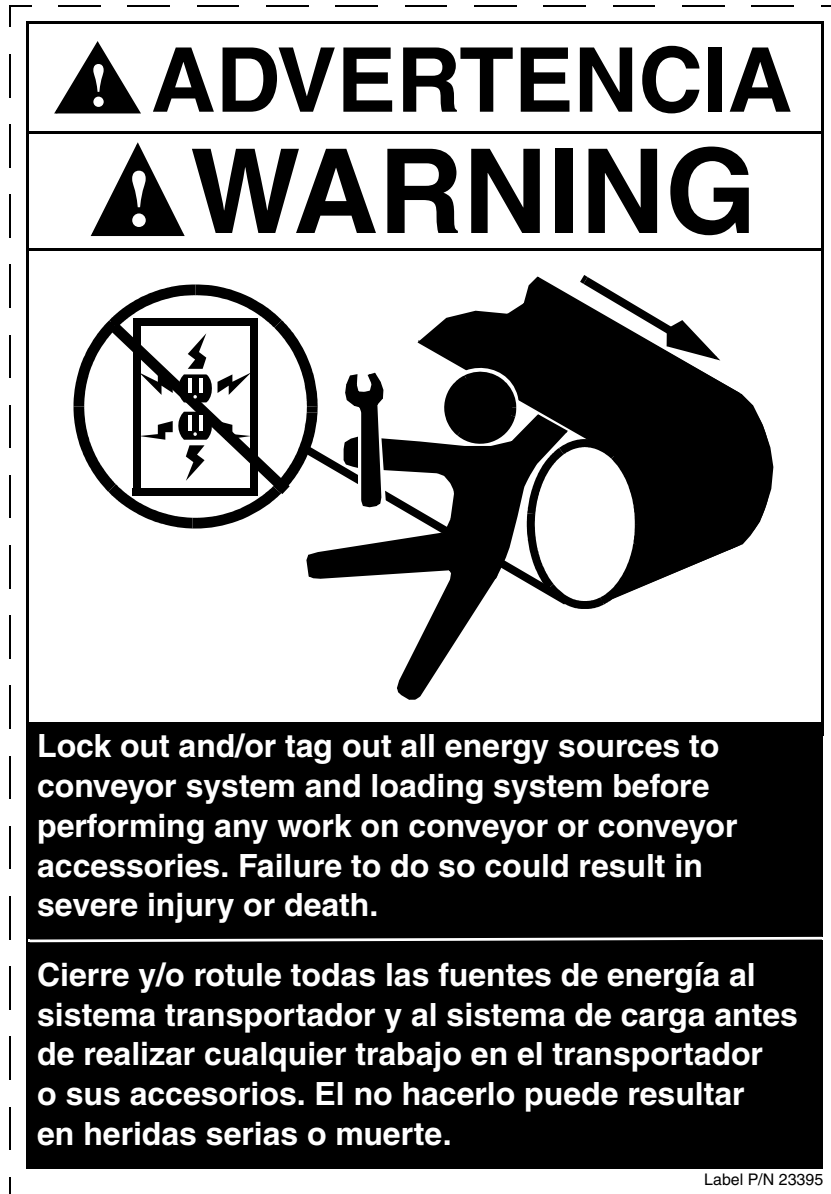
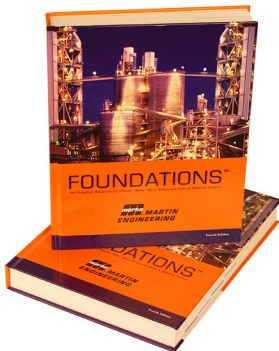


Figure 6. Martin® Conveyor Products Warning Label, P/N 23395

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